TEST REPORT
IEC 60950-22
Information technology equipment – Safety –
Part 22: Equipment to be installed outdoors

Report Number. ..... :	**466002-1**
Date of issue ..... :	**2022-06-10**
Total number of pages ..... :	**28**
Name of Testing Laboratory preparing the Report ..... :	**Nemko S.p.A.**
Applicant's name ..... :	Aesys SpA
Address ..... :	Via Artigiani, 41 – 24060 Brusaporto (BG) – Italy
Test specification:	
Standard ..... :	IEC 60950-22:2016 for use in conjunction with IEC 60950-1:2005, AMD1:2009, AMD2:2013
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC60950_22C
Test Report Form(s) Originator .... :	The Standards Institution of Israel
Master TRF ..... :	Dated 2019-09-29

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This Test Report, when bearing the Nemko name and logo is only valid when issued by a Nemko laboratory, or by a laboratory having special agreement with Nemko.

Test item description..... :	Monitor with accessory
Trade Mark(s) ..... :	aesys (aesys)
Original Product/Equipment Manufacturer ..... :	Same as Applicant
Branding Manufacturer(s)..... :	-
Model/Type reference..... :	Monitor: CPTOU4615 **a b**L3ARI**c**H-**defghi**Z0 (see page 12 of main report for details of speaking code) Sound bar (accessory): Slim Soundbar 46'' MC ALC
Ratings..... :	Monitor: 2.7 A, 220-240 Vac, 50/60 Hz IP65, class I equipment Sound bar (accessory): 8-30 Vdc, 3 A, IP65, Class III equipment

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):

☒	**CB Testing Laboratory:**		
Testing location/ address ..... :		Nemko S.p.A. Via del Carroccio, 4 – 20853 Biassono (MB), Italy	
Tested by (name, function, signature)..... :		Giulio Tassinari (Project Handler)	
Approved by (name, function, signature) .. :		Daniele Dario Amati (Verificator)	
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address ..... :			
Tested by (name, function, signature)..... :			
Approved by (name, function, signature) .. :			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address ..... :			
Tested by (name + signature)..... :			
Witnessed by (name, function, signature) . :			
Approved by (name, function, signature) .. :			
☐	**Testing procedure: CTF Stage 3:**		
☐	**Testing procedure: CTF Stage 4:**		
Testing location/ address ..... :			
Tested by (name, function, signature)..... :			
Witnessed by (name, function, signature) . :			
Approved by (name, function, signature) .. :			
Supervised by (name, function, signature) :			

List of Attachments (including a total number of pages in each attachment):

Attachment 1: Measurement Uncertainty (4 pages)
Attachment 2: List of instruments used for testing (1 page)

Summary of testing:

This project is an update of previous test report ref. no. 445992-1 issued by Nemko S.p.A. to include the following modifications:

-Introduction of Fibre-Ethernet converter with dedicated optical fibre connector on bottom side of enclosure. Considering that Fibre-Ethernet converter is an internal component of monitor and that Optical fibre connector is of same family of LAN connector (Harting PushPull V4 series) no additional test have been performed.

-Speaking code has been introduced, to cover all possible combination of monitors.

Here below the project history of this product:

Project number	Date of issue	Main modifications introduced:
422879	2021-11-15	Original reports according to IEC 62368-1:2014 and IEC 60950-22:2016
455992	2022-01-13	Addition of accessory Sound bar mod. Slim Soundbar 46'' MC ALC.
466002	2022-06-10	Introduction of Fibre-Ethernet converter. Optical fibre connector is an alternative to Ethernet connector in the bottom side of enclosure. Speaking code has been introduced, to cover all possible combination of monitors

General considerations:

Since requirements for outdoor equipment are not included in IEC 62368-1:2014 standard, so a test report according to IEC 60950-22:2016 has been issued.

Cl. 8.2 - Resistance to ultra-violet radiation.
Cable gland for audio cable; this component is separately approved according to UL 514B, that has same requirements of this Annex of IEC 62368-1 concerning resistance to UV radiation. It has been considered to comply with requirements without additional evaluations.
Plastic material of cooling fans in the rear side of equipment is rated (f1) according to UL 746C, that has same requirements of this Annex of IEC 62368-1 concerning resistance to UV radiation. It has been considered to comply with requirements without additional evaluations.
Mains connector, LAN connector, Optical fibre connector and covers on antenna have not been investigated for direct exposure to solar radiation, suitability of equipment shall be evaluated in final installation.

Cl. 8.3 – Resistance to corrosion. Resistance to corrosion test has been performed on a smaller sample having same characteristics of equipment in terms of material used for enclosure, coating, connector and gaskets. Parts that present rusting at the end of test (screws, spacers) have been replaced with components made of stainless steel, that are considered inherently compliant with resistance corrosion requirements, according to IEC TR 62368-1:2019. Considering that enclosure of Sound bar is made of same material of monitor, with same coating, test performed on Monitor have been considered to cover requirements also for Sound bar.

Cl. 8.5 – Gaskets. Gasket between rear and front part of monitor has been tested according to requirements of Annex Y.4.3. Equipment is not intended to be exposed to oil and the gasket is not secured by adhesive, so requirements of Cl. 8.5.2 and 8.5.3 have not been applied. Gasket used for Sound bar is with closed cell construction, so it has been subjected to tests of Annex D. This gasket is kept in position by means of adhesive, that is not damaged when cover is opened.

Cl. 9 – Protection of equipment within an outdoor enclosure. Monitor and Sound bar are provided with a IP65 enclosure, refer to separate test report ref. no. 422879-1TRFEnvEx (for monitor) and 423304-1TRFEnvEx (for Sound bar) issued by Nemko Spa.

Cl. 10.2 – Impact test. Covers of antennas contain class 1 energy sources only and do not affect IP protection of equipment (they are mounted on an external support), so requirements of this clause have not been applied to these components.

Main test report ref. no. 466002 is according to IEC 62368-1:2014 standard instead of IEC 60950-1 standard, so in each point of IEC 60950-22 test report form where a reference to a specific clause of IEC 60950-1 is made, the relevant clause of IEC 62368-1:2014 has been applied.

For additional considerations, refer to main test report ref. no. 466002 issued by Nemko S.p.A. according to IEC 62368-1:2014.

Tests performed (name of test and test clause):

Project 422879:
All other relevant test performed on monitor model CPTOU4615 LS P3L3ARIO2H-4G1WTTSPFAEZ0

Project 455992:
All relevant test performed on Sound bar model Slim Soundbar 46'' MC ALC

Project 466002:
No test performed.

Note: The following Nemko technical procedures were also applied during testing:
- WM L0177 General routines for using instruments at Nemko.
- WM L1002: Measurement Uncertainty – Policy and Statement.

Statement of the measurement uncertainty:

See Attachment 1 for Measurement Uncertainty

Unless different values are declared in the test case, following ambient conditions apply for the tests:

- Ambient temperature 18-33 °C
- Relative Humidity 30-70 %
- Atmospheric Pressure 860-1060 hPa

Equipment used for testing is recorded and saved the company archive into Attachment 2 to this test report.

Testing location:

Nemko Spa
Via del Carroccio, 4 – 20853 Biassono (MB) – Italy

Summary of compliance with National Differences (List of countries addressed):

- European Countries (no deviation listed on IECEE website, checked on June 2022)
- Australia & New Zealand (no deviation listed on IECEE website, checked on June 2022)

☒ **The product fulfils the requirements of:**

- **EN 60950-22:2017**
- **IEC 60950-22:2016**

Including Corrigenda available on date of issue of this test report.

Statement concerning the uncertainty of the measurement systems used for the tests
(may be required by the product standard or client)

☒ **Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:**

Procedure number, issue date and title:

WM L1002 – Measurement Uncertainty – Policy and statement, rev. 23, dated 03-2021

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

☐ **Statement not required by the standard used for type testing**

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Refer to main test report ref. no. 466002.

Calibration	All instruments used in the tests given in this test report are calibrated and traceable to national or international standards. Further information about traceability will be given on request.
Measurement uncertainty	The measurement uncertainty was calculated for each test and quantity listed in this test report, according to IEC Guide 115 and other specific test standard and is documented in Nemko Spa working manual WM L1002.
Assessment of conformity	The assessment of conformity for each test performed on the equipment is performed not taking into account the measurement uncertainty. The two following possible verdicts are stated in the report: P (Pass) - The measured values of the equipment respect the specification limit at the points tested. The specific risk of false accept is up to 50% when the measured result is close to the limit. F (Fail) - One or more measured values of the equipment do not respect the specification limit at the points tested. The specific risk of false reject is up to 50% when the measured result is close to the limit.

Test item particulars..... :	
Classification of installation and use..... :	Class I equipment, wall mounted
Supply Connection ..... :	Pluggable equipment type A with appliance coupler
Temperature range ..... :	From -20 °C to +50 °C
Overvoltage category..... :	☐ OVC I ☒ OVC II ☐ OVC III ☐ OVC IV
IP protection class..... :	IP65
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing.....:	
Date of receipt of test item .....:	2020-10-15 (project 422879) and 2021-05-13 (project 455992 and 466002)
Date (s) of performance of tests.....:	2021-01-25 to 2021-02-23 and 2021-09-20 to 2021-10-15 (project 422879) and 2021-12-15 to 2021-12-30 (project 455992)

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.
The phase of sampling / collection of equipment under test is carried out by the customer.
Results indicated in this test report apply to samples as received.
Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) ..... :	Aesys SpA Via Artigiani, 41 – 24060 Brusaporto (BG) – Italy

General product information and other remarks:

Refer to main test report ref. no. 466002.

S/n of model tested:
899707 (for monitor used for all tests except resistance to corrosion)
0001 identified by Nemko Spa (for monitor used for resistance to corrosion test only)
0000903965 (Sound bar)

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4	**CONDITIONS FOR OUTDOOR EQUIPMENT**		
4.1	**Ambient air temperature**		P
	Suitability for use at any temperature in the range specified by the manufacturer. If not specified by the manufacturer, the range is taken as -33°C to +40°C	-20 °C to +50 °C considered.	P
4.2	**Mains supply**		P
4.2.1	General		P
	Suitability for the highest mains transient voltage expected in the installation location	Equipment is intended to be supplied by socket outlets (pluggable equipment type A). It is not part of the building installation.	P
	Components within outdoor equipment that reduce mains transient voltage or the prospective fault current comply with IEC 61643-series		N/A
4.2.2	Mains transient voltage on AC mains supply	Overvoltage category II considered.	P
4.2.3	Mains transient voltage on DC mains supply		N/A
4.3	**Rise of earth potential**		P
	Special earthing conditions		P
	Reference to installation instructions ..... :	Section 3 of installation instructions.	P
5	**MARKING AND INSTRUCTIONS**		P
	Special installation features for protection from conditions in the outdoor location (see 1.7.2 of IEC 60950-1:2005)	All information about installation requirements is included inside manual. Requirements of IEC 62368-1:2014 standard applied in place of requirements of Cl. 1.7.2 of IEC 60950-1.	P
	outdoor enclosure classification according to IEC 60529 (IP Code)	IP65 marked.	P
6	**PROTECTION FROM ELECTRICAL SHOCK IN AN OUTDOOR LOCATION**		P
6.1	**Voltage limits of user-accessible parts in outdoor locations** (2.2.2 and 2.2.3 of IEC 60950-1:2005/AMD2:2013 with voltage limits of IEC60950-22)		P
	Voltages under normal conditions (V)..... :	Voltage of accessible parts under normal conditions is less than 30 Vdc. See table 5.2 inside main test report ref. no. 466002 for details.	P

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Voltages under fault conditions (V) ..... :	Voltage of accessible parts under fault conditions is less than 30 Vdc. See table 5.2 inside main test report ref. no. 466002 for details.	P
6.2	**Limited current circuits in outdoor locations**		P
	The requirements of 2.4 of IEC60950-1:2005/ AMD1:2009/AMD2:2013 apply without change	Only inside separetely approved AC/DC switching power supply. Capacitor and resistors are not used as reinforced safeguards according to IEC 62368-1:2014 in other parts of equipment. Clauses 5.5.2.1 and 5.5.6 of IEC 62368-1:2014 applied in place of Clause 2.4 of IEC 60950-1.	P
6.3	**Protection for socket-outlet in outdoor locations**		N/A
	Use of residual current protective device (RCD) with rated residual operating current not exceeding 30 mA in the mains supply to socket-outlets intended for general use and with a rated current not exceeding 20 A.	No socket-outlets.	N/A
	RCD is an integral part of the equipment		N/A
	RCD is part of the building installation (installation instructions)		N/A
7	**WIRING TERMINALS FOR CONNECTION OF EXTERNAL CONDUCTORS**		N/A
	The mains supply terminations powered via the normal building installation wiring are as specified in 3.3 of IEC 60950-1:2005/AMD2:2013	Pluggable equipment type A provided with an appliance inlet. Requirements of Cl. 5.6.5 and Annex G.7.6 of IEC 62368-1:2014 standard applied in place of Cl. 3.3 of IEC 60950-1.	N/A
	The mains supply terminations powered directly from the mains distribution system are as specified in IEC 60364	See above.	N/A
	NOTE: For other terminals, IEC 60950-1 applies.		N/A
8	**CONSTRUCTION REQUIREMENTS FOR OURDOOR ENCLOSURES**		P
8.1	**General**		P
	Protection against corrosion by use of suitable materials or by application of a protective coating		P
	Parts serving as a functional part of an outdoor enclosure (e.g., dials, connectors, etc.) comply with the same environmental protection requirements as for the outdoor enclosure		P

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Use of outdoor enclosure to carry current during normal operation	Enclosure of equipment is not used to carry current during normal operation.	P
	Connection of a conductive part of an outdoor enclosure to protective earth for carrying fault currents (see 2.6 of IEC60950-1:2005/ AMD1:2009/ AMD2:2013 and 8.3 of this standard)	See Cl. 5.6.6 of main test report ref. no. 466002. Requirements of Cl. 5.6 of IEC 62368-1:2014 standard applied in place of Cl. 2.6 of IEC 60950-1.	P
8.2	**Resistance to ultra-violet radiation**		P
	Resistance of non-metallic parts of an outdoor enclosure to degradation by ultra-violet (UV) radiation	See Summary of testing.	P
	Parts providing mechanical support:		N/A
	Tensile strength test (ISO 527)		N/A
	Flexural strength test (ISO 178)		N/A
	Parts providing impact resistance:		N/A
	Charpy impact test (ISO 179)		N/A
	Izod impact test (ISO 180)		N/A
	Tensile impact test (ISO 8256)		N/A
	All parts:		N/A
	Flammability classification (1.2.12 and annex A of IEC 60950-1:2005)	See separate main report no. 466002 for details of flammability classification of materials.	P
8.3	**Resistance to corrosion**		P
8.3.1	General	Considered.	P
	Resistance of metallic parts of an outdoor enclosure to the effects of water-borne contaminants		P
	Alternate method for 8.3.2-8.3.4 (IEC 61587-1)	Clauses from 8.3.2 to 8.3.4 applied.	N/A
8.3.2	Test apparatus		P
	Salt-spray test (IEC 60068-2-11)		P
	Test in a water-saturated sulphur dioxide atmosphere (water-saturated sulphur dioxide atmosphere as described in Annex A; chamber as described in ISO 3231)		P
8.3.3	Test procedure	2 period of 12 days each, composed by 168 h of exposure to salt spray atmosphere and 5 exposures of 8 h to SO_2 atmosphere followed by 16 h of rest.	P
	Alternate test procedure		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	Compliance criteria:		P
	No rust other than surface corrosion of the protective coating; no cracking or other deterioration that will jeopardize the safety aspects as follows:	No rust, cracking or other deterioration of enclosure. Only corrosion of external coating.	P
	– continued protection against access to hazardous parts, including after mechanical strength tests; and		P
	– continued protection against ingress of dust and water; and		P
	– continued provision of earth continuity		P
8.4	**Bottoms of fire enclosures**		P
	Comply with 4.6.2 of IEC 60950-1:2005	Requirements of Cl. 6.4.8.3.4 of IEC 62368-1:2014 standard applied in place of Cl. 4.6.2 of IEC 60950-1.	P
	Bottom of fire enclosure of outdoor equipment mounted directly and permanently on a non-combustible surface (e.g., concrete or metal)		N/A
8.5	**Gaskets**		P
8.5.1	General	See Annex D.	P
8.5.2	Oil resistance	Gasket are not intended to be exposed to oil	N/A
8.5.3	Securing means	Gasket are kept in position by means of mechanical means inside Monitor and by adhesive inside Sound bar.	P
9	**PROTECTION OF EQUIPMENT WITHIN AN OUTDOOR ENCLOSURE**		P
9.1	**Protection from moisture**		P
	Adequate protection from the effect of moisture on the enclosed equipment (see Table 2)	Equipment is provided with a IP65 enclosure. See Summary of testing.	P
9.2	**Protection from plants and vermin**		N/A
	Adequate protection if entry by plants and vermin is a consideration	Not a consideration.	N/A
9.3	**Protection from excessive dust**	Equipment is provided with a IP65 enclosure. See Summary of testing.	P
9.3.1	General		P
	Adequate protection against the ingress of the dust through the use of an appropriately rated IP5X or IP6X enclosure, or equivalent		P
9.3.2	IP5X equipment		N/A
9.3.3	IP6X equipment		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10	**MECHANICAL STRENGTH OF ENCLOSURES**		P
10.1	**General**		P
	Adequate mechanical strength and protection against access to energized parts and other hazards within the equipment throughout the intended ambient operating range		P
10.2	**Impact test (4.2.5 of IEC 60950-1)**		P
	Low temperature conditioning for polymeric enclosures	See Summary of testing.	N/A
	Compliance criteria:		P
	- after test the level of protection remains in accordance with 9.1 of this standard	No damage or deformation of enclosure.	P
	- after test the requirements of 4.2.1 of IEC 60950-1: 2005/AMD1:2009/AMD2:2013 are met	Requirements of 4.4.4.9 of IEC 62368-1:2014 standard applied in place of Cl. 4.2.5 of IEC 60950-1. See main report 466002 issued by Nemko S.p.A. according to IEC 62368-1:2014.	P
11	**OUTDOOR EQUIPMENT CONTAINING VENTED BATTERIES**		N/A
11.1	**Risk of explosion from lead acid, NiCd and NiMH batteries**		N/A
	Adequate ventilation in the compartment housing a valve regulated or vented battery, where gassing is possible during normal usage or over-charging	No vented batteries.	N/A
	Protection against the risk of ignition of local concentrations of hydrogen and oxygen in a compartment containing both a battery and electrical components		N/A
	Construction of the ventilation system to ensure explosive gases venting in case of any potential fault, including distortion of the battery cases due to overheating or thermal runaway		N/A
	Ventilation tubes used for conducting explosive gas from the battery cases to the outside air		N/A
	Adequate ventilation under single-fault failure conditions in case of mechanical or forced-air ventilation		N/A
	Enclosures with mechanical or electromechanical dampers		N/A
11.2	**Ventilation preventing an explosive gas concentration**		N/A
	Comply with M.7 of IEC 62368-1:2014		N/A
11.3	**Ventilation test**		N/A
	Measured hydrogen gas concentration (% by volume) ..... :		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Max. allowed gas concentration for the mixture location in proximity to an ignition source (% by volume) ..... :		N/A
	Max. allowed gas concentration for the mixture location not in proximity to an ignition source (% by volume) ..... :		N/A
	Overcharging of rechargeable battery (see 4.3.8 of IEC 60950-1:2005/AMD2:2013)		N/A
A	**ANNEX A, WATER-SATURATED SULPHUR DIOXIDE ATMOSPHERE (see 8.3.2 and 8.3.3)**		P
	Test chamber ..... :	ISO 3231	P
	Test method ..... :	Test method described in Cl. 8.3.3 used.	P
B	**ANNEX B, WATER SPRAY TEST (see 9.1)**		N/A
	Test apparatus ..... :		N/A
	Test method ..... :		N/A
C	**ANNEX C, ULTRAVIOLET LIGHT CONDITIONING TEST (see 8.2)**		N/A
C.1	Test apparatus ..... :		N/A
C.2	Mounting of test samples ..... :		N/A
C.3	Carbon-arc light-exposure apparatus ..... :		N/A
C.4	Xenon-arc light-exposure apparatus ..... :		N/A
D	**ANNEX D, GASKET TESTS (see 8.5)**		P
D.1	Gasket tests		P
D.2	Tensile strength and elongation tests (for gaskets that can stretch)		P
	Tensile strength (%) ..... :	98.1%	P
	Elongation (%) ..... :	102.3%	P
	Visible deterioration, deformation, melting, cracking or hardening of the material ..... :	No deformation, melting, cracking or hardening of material of gaskets.	P
D.3	Compression test (for gaskets with closed cell construction)	Considered for gasket inside Sound bar	P
	Initial thickness of the specimen (mm) ..... :	2.05	P
	Thickness of the specimen after test a) (mm), compression set after test a) (%) ..... :	1.20	P
	Thickness of the specimen after test b) (mm), compression set after test b) (%) ..... :	1.12	P
	Thickness of the specimen after test c) (mm), compression set after test c) (%) ..... :	1.06	P
D.4	Oil immersion test	Equipment is not intended to be exposed to oil.	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Swelling (%) ..... :		N/A
	Shrinking (%) ..... :		N/A
E	**ANNEX E, RATIONALE**		—
E.1	General	Considered.	—
E.2	Electric shock		—
E.3	Energy related hazards		—
E.4	Fire		—
E.5	Mechanical hazards		—
E.6	Heat related hazards		—
E.7	Radiation		—
E.8	Chemical hazards		—
E.9	Biological hazards		—
E.10	Explosion hazards		—

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

8.2	**TABLE: Resistance to ultra-violet radiation**	
8.2a)	**Tensile strength test (ISO 527)**	N/A
Material identification (manufacturer, type designation) ..... :		—
Shape and dimensions of test samples..... :		—
Conditioning for Set 1 of samples..... :		—
Conditioning for Set 2 of samples (including Annex C) ..... :		—
Test conditions (T °C, RH %)..... :		—

Set 1 (without Annex C conditioning)		Set 2 (after Annex C conditioning)	
Test sample #	Tensile strength (MPa)	Test sample #	Tensile strength (MPa)

Arithmetic mean for Set 1 (MPa) .....:	
Arithmetic mean for Set 2 (MPa) .....:	
Retention (%).....:	
Supplementary information:	

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

8.2	**TABLE: Resistance to ultra-violet radiation**	
8.2b)	**Flexural strength test (ISO 178)**	N/A
Material identification (manufacturer, type designation) .....:		—
Shape and dimensions of test samples .....:		—
Conditioning for Set 1 of samples .....:		—
Conditioning for Set 2 of samples (including Annex C).....:		—
Test conditions (T °C, RH %).....:		—

Set 1 (without Annex C conditioning)		Set 2 (after Annex C conditioning)	
Test sample #	Flexural strength (MPa)	Test sample #	Flexural strength (MPa)

Arithmetic mean for Set 1 (MPa).....:	
Arithmetic mean for Set 2 (MPa).....:	
Retention (%) .....:	
Supplementary information:	

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

8.2	**TABLE: Resistance to ultra-violet radiation**	
8.2c)	**Charpy impact test (ISO 179) - unnotched**	N/A
Material identification (manufacturer, type designation) .....:		—
Shape and dimensions of test samples .....:		—
Conditioning for Set 1 of samples .....:		—
Conditioning for Set 2 of samples (including Annex C).....:		—
Test method (according to Tables 2 and 3 of ISO 179) .....:		—
Test conditions (T °C, RH %).....:		—

Set 1 (without Annex C conditioning)		Set 2 (after Annex C conditioning)	
Test sample #	Charpy impact strength (kJ/m^2)	Test sample #	Charpy impact strength (kJ/m^2)

Arithmetic mean for Set 1 (kJ/m^2) .....:	
Arithmetic mean for Set 2 (kJ/m^2) .....:	
Retention (%) .....:	
Supplementary information:	

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

8.2	**TABLE: Resistance to ultra-violet radiation**	
8.2d)	**Charpy impact test (ISO 179) - notched**	N/A
Material identification (manufacturer, type designation) .....:		—
Shape and dimensions of test samples .....:		—
Conditioning for Set 1 of samples .....:		—
Conditioning for Set 2 of samples (including Annex C).....:		—
Test method (according to Tables 2 and 3 of ISO 179) .....:		—
Test conditions (T °C, RH %).....:		—

Set 1 (without Annex C conditioning)		Set 2 (after Annex C conditioning)	
Test sample #	Charpy impact strength (kJ/m^2)	Test sample #	Charpy impact strength (kJ/m^2)

Arithmetic mean for Set 1 (kJ/m^2) .....:	
Arithmetic mean for Set 2 (kJ/m^2) .....:	
Retention (%) .....:	
Supplementary information:	

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

8.2	**TABLE: Resistance to ultra-violet radiation**	
8.2e)	**Izod impact test (ISO 180) - unnotched**	N/A
Material identification (manufacturer, type designation) .....:		—
Shape and dimensions of test samples .....:		—
Conditioning for Set 1 of samples .....:		—
Conditioning for Set 2 of samples (including Annex C).....:		—
Test method (according to Table 1 of ISO 180) .....:		—
Test conditions (T °C, RH %).....:		—

Set 1 (without Annex C conditioning)		Set 2 (after Annex C conditioning)	
Test sample #	Izod impact strength (kJ/m^2)	Test sample #	Izod impact strength (kJ/m^2)

Arithmetic mean for Set 1 (kJ/m^2) .....:	
Arithmetic mean for Set 2 (kJ/m^2) .....:	
Retention (%) .....:	

Supplementary information:

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

8.2	**TABLE: Resistance to ultra-violet radiation**	
8.2f)	**Izod impact test (ISO 180) - notched**	N/A
Material identification (manufacturer, type designation) .....:		—
Shape and dimensions of test samples .....:		—
Conditioning for Set 1 of samples .....:		—
Conditioning for Set 2 of samples (including Annex C).....:		—
Test method (according to Table 1 of ISO 180) .....:		—
Test conditions (T °C, RH %).....:		—

Set 1 (without Annex C conditioning)		Set 2 (after Annex C conditioning)	
Test sample #	Izod impact strength (kJ/m^2)	Test sample #	Izod impact strength (kJ/m^2)

Arithmetic mean for Set 1 (kJ/m^2) .....:	
Arithmetic mean for Set 2 (kJ/m^2) .....:	
Retention (%) .....:	
Supplementary information:	

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

8.2	**TABLE: Resistance to ultra-violet radiation**	
8.2g)	**Tensile impact test (ISO 8256) - unnotched**	N/A
Material identification (manufacturer, type designation) .....:		—
Shape and dimensions of test samples .....:		—
Conditioning for Set 1 of samples .....:		—
Conditioning for Set 2 of samples (including Annex C).....:		—
Test method (A or B)		—
Test conditions (T °C, RH %).....:		—

Set 1 (without Annex C conditioning)		Set 2 (after Annex C conditioning)	
Test sample #	Tensile impact strength (kJ/m^2)	Test sample #	Tensile impact strength (kJ/m^2)

Arithmetic mean for Set 1 (kJ/m^2) .....:	
Arithmetic mean for Set 2 (kJ/m^2) .....:	
Retention (%) .....:	
Supplementary information:	

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

8.2	**TABLE: Resistance to ultra-violet radiation**	
8.2h)	**Tensile impact test (ISO 8256) - notched**	N/A
Material identification (manufacturer, type designation) .....:		—
Shape and dimensions of test samples .....:		—
Conditioning for Set 1 of samples .....:		—
Conditioning for Set 2 of samples (including Annex C).....:		—
Test method (A or B)		—
Test conditions (T °C, RH %).....:		—

Set 1 (without Annex C conditioning)		Set 2 (after Annex C conditioning)	
Test sample #	Tensile impact strength (kJ/m^2)	Test sample #	Tensile impact strength (kJ/m^2)

Arithmetic mean for Set 1 (kJ/m^2) .....:	
Arithmetic mean for Set 2 (kJ/m^2) .....:	
Retention (%) .....:	

Supplementary information:

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Critical components information				P
Object / part No.	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
(see separate test report 466002 issued by Nemko S.p.A. according to IEC 62368-1: 2014)					
Supplementary information: [1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.					

Attachment 1: Measurement Uncertainty

Hereafter Nemko's measurement uncertainties are reported:

Test	Range	Measurement Uncertainty	Note
Environmental testing	Temperature -70 °C ÷ 180 °C – Chamber center	1.4 °C	(1)
	Temperature -70 °C ÷ 180 °C – Overall chamber	1.8 °C	(1)
	Relative Humidity 10 % ÷ 98 % – Chamber center	3 %	(1)
	Relative Humidity 10 % ÷ 98 % – Overall chamber	4 %	(1)
IP protection	Water flow 0.5 l/min ÷ 100 l/min	5 %	(1)
	Air flow	5 %	(1)
	Force 50 N, 30 N, 3 N, 1 N	6 %	(1)
	Dimensions 50 mm, 12.5 mm, 2.5 mm, 1 mm	0.05 mm	(1)
Construction verifications	AC/DC Voltage 10 mV ÷ 1000 V up to 5 kHz	1.5·%	(1)
	AC/DC Voltage 10 mV ÷ 1000 V 5÷100 kHz	2.5·%	(1)
	AC/DC Current 0.1 mA ÷ 5 A up to 1 kHz	1.5·%	(1)
	AC/DC Current 5 A ÷ 400 A up to 1 kHz	2.5·%	(1)
	Resistance 100 mΩ ÷ 10 MΩ	2.0·%	(1)
	Active/Apparent Power 200 mW ÷ 1 W	20 mW	(1)
	Active/Apparent Power 1 W ÷ 6 kW	3.0 %	(1)
	Power factor	0.05	(1)
	Frequency	0.2 %	(1)
	Dimensions 0 ÷ 200 mm	0.05 mm	(1)
	Dimensions 0.2 ÷ 200 m	0.5 %	(1)
	Angle and Inclination 0 ÷ 360 °	0.3 °	(1)
	Force 0.2 ÷ 2.5 kN	3 %	(1)
	Torque 0.1 ÷ 200 Nm	5 %	(1)
	Mechanical energy 0.2 ÷ 50 J	10 %	(1)
	Weight 1 g ÷ 2 kg	1.0 % or 0.1 g	(1)
	Weight 2 kg ÷ 100 kg	2 %	(1)
Heating	Temperature 20 °C ÷ 400 °C	4.5 °C	(1)
Pressure measurement	Pressure -0.5 bar ÷ 700 bar	1.0·%	(1)
Temperature measurement	Temperature -40 °C ÷ 300 °C	2.0 °C	(1)
Protection against access to live parts	Dimensions 1 ÷ 1000 mm	0.08 mm or 0.3 %	(1)
	Force 0.2 ÷ 1000 N	3%	(1)
Power input and current	Active/Apparent Power 0.2 W ÷ 6 kW	20 mW or 3 %	(1)
	AC/DC Current 1 mA ÷ 5 A up to 1 kHz	1.5 %	(1)
Leakage and touch current	AC Current 0.01 mA ÷ 200 mA up to 500 Hz	3.5 %	(1)
	AC Current 0.01 mA ÷ 200 mA 0.5 kHz to 5 kHz	5.0 %	(1)
	AC Current 0.01 mA ÷ 200 mA 5 kHz to 100 kHz	10.0 %	(1)
	AC Current 0.01 mA ÷ 200 mA 100 kHz to 1 MHz	20.0 %	(1)
Earth impedance	Impedance 1 mΩ ÷ 10 kΩ	3 mΩ or 4 %	(1)
Continuity resistance	AC 10 mΩ ÷ 2 Ω, 5 A ÷ 32 A	3 mΩ or 5 %	(1)
	AC 2 Ω ÷ 100 Ω, 100 mA or 200 mA	5 %	(1)
	DC 1 mΩ ÷ 1 kΩ, 0.01 A ÷ 10 A	5 %	(1)
Insulation resistance	10 kΩ ÷ 200 GΩ, 10 V ÷ 1000 V	3.0·%	(1)
	200 GΩ ÷ 1000 GΩ, 500 V ÷ 1000 V	5.0·%	(1)
Dielectric strength	AC Voltage 0.1 kV ÷ 5 kV (50 Hz or 60 Hz)	3.0 %	(1)
	DC Voltage 0.1 kV ÷ 6 kV	3.0 %	(1)
	AC/DC Current 0.1 mA ÷ 200 mA up to 1 kHz	5 %	(1)
Transients	Pulse voltage	10·%	(1)
EMF	-	25 %	(1)
Plug discharge	Voltage	5 %	(1)
Working voltage	Voltage	5 %	(1)
	Frequency	5 %	(1)
Tracking test	Voltage, Current	1.5 %	(1)
	Drops - count	7	(1)

NOTES:
(1) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 %

Test	Range	Measurement Uncertainty	Note
Moisture resistance	See Environmental testing and IP protection		(1)
Overload protection	See Construction verifications and Heating		(1)
Abnormal operation	See Construction verifications and Heating		(1)
Mechanical strength	Force 0.2 ÷ 2.5 kN Length 1 ÷ 1000 mm	See Construction verifications	(1)
Resistance to heat and fire (Glow wire test)	Glow wire temperature	5 °C	(1)
Resistance to heat and fire(Ball pressure test)	Ball pressure dimension	0.1 mm	(1)
Time Measurements	10 ms ÷ 8 h	1 %	(1)
Velocity Measurements	0 ÷ 5 m/s	5 %	(1)
Salt mist	See 60068-2-11	(2)	(1)
Vibration	5 Hz ÷ 2 kHz	5.0 %	(1)
Sound power/pressure level	31 Hz ÷ 4 kHz	3.0 dB	(1)
	4 kHz ÷ 10 kHz	6.0 dB	(1)
	A-weighted, C-weighted	2.0 dB	(1)

NOTES:
(1) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 %
(2) The instruments used for this test is according to the tolerances requested by the standard 60068-2-11

Test	Range	Measurement Uncertainty	Note
Radiance Blue light, Retinal thermal, Retinal thermal weak visual stimulus	0 ÷ 0.1 MW/(sr·m²) 300 ÷ 1400 nm	7.0 %	(1) (4)
	0.1 ÷ 100 MW/(sr·m²) 300 ÷ 1400 nm	8.0 %	
Luminance	0 ÷ 0.1 Mcd/m²	7.0 %	(1)
	0.1 ÷ 100 Mcd/m²	8.0 %	
Irradiance Actinic UV, Near UV, Blue light small source, IR radiation, eye	0 ÷ 0.1 MW/(m²) 200 ÷ 300 nm	9.2 %	(1) (5)
	0.1 ÷ 100 MW/(m²) 200 ÷ 300 nm	10.0 %	
	0 ÷ 0.1 MW/(m²) 300 ÷ 3000 nm	6.4 %	
	0.1 ÷ 100 MW/(m²) 300 ÷ 3000 nm	7.2 %	
Illuminance	0 ÷ 20 klx	4.0 %	(1)
Spectral Radiance	0 ÷ 0.1 MW/(sr·m²·nm) 300 ÷ 1400 nm	6.2 %	(1)
	0.1 ÷ 1 MW/(sr·m²·nm) 300 ÷ 1400 nm	7.0 %	
Spectral Irradiance	0 ÷ 0.1 MW/(m²·nm) 200 ÷ 300 nm	8.6 %	(1)
	0.1 ÷ 1 MW/(m²·nm) 200 ÷ 300 nm	9.2 %	
	0-0.1 MW/(m²·nm) 300 ÷ 3000nm	5.4 %	
	0.1 ÷ 1 MW/(m²·nm) 300 ÷ 3000 nm	6.4 %	
Radiant power Laser radiation Output power	350 ÷ 400 nm 950 ÷ 3000 nm 30 uW ÷ 30 W	9.0 %	(1), (2), (3)
	400 ÷ 950 nm 50 nW ÷ 3 W	4.6 %	(1), (2), (3)
Radiant energy Laser radiation	350 ÷ 400 nm 950 ÷ 3000 nm 20 uJ ÷ 2 J	9.0 %	(1), (2)
	400 ÷ 950 nm 20 uJ ÷ 2 J	4.6 %	(1), (2)
Wavelength	200 ÷ 3000 nm	4.5 %	(1)
Length in optical measurement	0 ÷ 20 mm	0.5 mm	(1)
	20 ÷ 200 mm	2 mm	
	0.2 ÷ 200 m	0.5 %	

NOTES:
(1) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 %
(2) In the standard 60825-1 laser radiation can indicate radiant power or radiant energy
(3) In the standard 60825-1 the radiant power can be called also output power
(4) The uncertainty value expressed in W/(m²) is the maximum value between the value measured and the limit stated in the standard (see IEC/EN62471) multiplied to the measurement uncertainty stated in the table
(5) The uncertainty value expressed in W/(sr·m²) is the maximum value between the value measured and the limit stated in the standard (see IEC/EN62471) multiplied to the measurement uncertainty stated in the table

Test	Range	Measurement Uncertainty	Notes
Radiated Disturbance 10m Chamber	Antenna distance 3 m, 10 m 0.009 ÷ 200 MHz	5.0 dB	(1)
	Antenna distance 1 m, 3 m, 10 m 200 ÷ 1000 MHz	5.2 dB	(1)
	Antenna distance 1 m, 3 m, 10 m 1 ÷ 6 GHz	5.2 dB	(1)
	Antenna distance 1 m, 3 m 6 ÷ 18 GHz	5.5 dB	(1)
	Antenna distance 1 m, 3 m 18 ÷ 40 GHz	7.2 dB	(1)
Radiated Disturbance with large loop antenna system (LLAS)	0.009 ÷ 30 MHz	3.3 dB	(1)
Conducted Disturbance	0.02 ÷ 150 kHz with AMN	3.8 dB	(1)
	150 kHz ÷ 30 MHz with AMN	3.4 dB	(1)
	150 kHz ÷ 30 MHz with AAN	4.6 dB	(1)
	9 kHz ÷ 30 MHz with voltage probe	2.9 dB	(1)
	150 kHz ÷ 30 MHz with current probe	2.9 dB	(1)
Clicks	9 ÷ 150 kHz	3.8 dB	(1)
	150 kHz ÷ 30 MHz	3.4 dB	(1)
Disturbance Power	30 MHz ÷300 MHz	4.5 dB	(1)
Frequency	10 Hz ÷ 1 kHz	0.2 %	(1)
	1 kHz ÷ 40 GHz	10^{-6}	(1)
Harmonic Current Emission	50 Hz ÷ 2 kHz	3 %	(1)
Fluctuation and Flickers	Fluctuation (d%)	0.05 %	(1)
	Flickers (Pst)	5 %	(1)
Radiated Immunity Anechoic Chambers	20 MHz ÷ 6 GHz	3.4 dB	(1) (3)
Radiated Immunity TEM Cell	0.01 ÷ 200 MHz	3.0 dB	(1) (3)
Bulk Current	1 ÷ 200 MHz	3.0 dB	(1)
Immunity to conducted disturbances	9 kHz ÷ 230 MHz	3.0 dB	(1)
ESD Immunity	Voltage, Current, Rise time, Duration	(2)	(1)
Burst Immunity	Voltage, frequency, burst period and duration, rise time and pulse width	(2)	(1)
Surge Immunity	Voltage, Current, Rise time, Duration	(2)	(1)
DIPS, Interruption and Voltage duration Immunity	Amplitude	5 %	(1)
	Duration	5 %	
Impulse Magnetic Field Immunity	Peak Current	10 %	(1)
	Rise time, Duration	20 %	(3)
Power Frequency Magnetic Field Immunity	16.7 Hz, 50 Hz, 60 Hz	2.0 dB	(1) (3)
Damped Oscillatory Wave Immunity, Ring Wave Immunity	Voltage, front time, frequency 100 kHz, 1 MHz	(2)	(1)
Damped Magnetic Field	Amplitude: 100 kHz, 1 MHz	3 dB	(1)
	Frequency: 100 kHz, 1 MHz	10 %	
Low Frequency Immunity	15 Hz ÷ 150 kHz	2.2 dB	(1)
Automotive transients Immunity	Voltage, rise time, duration time Impulses 1, 2a, 2b, 3a, 3b and 4	(2)	(1)
Automotive transients Emission	Amplitude, Time	10 %	(1)
EMF for Lighting Equipment	-	25 %	(1)
Electromagnetic fields (EMF)	Magnetic, Electric and Electromagnetic fields: 0 Hz ÷ 40 GHz	25 %	(1)
Electrical quantities (voltage, current, resistance)	AC/DC Voltage 10 mV ÷ 1000 V 0÷100 kHz AC/DC Current 0.1 mA ÷ 400 A 0÷1 kHz Resistance 100 mΩ ÷ 10 MΩ	2.5 %	(1)

NOTES:
(1) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 %
(2) The instruments used for this immunity test is according to the tolerances requested by the applicable standard
(3) The reported expanded uncertainty of measurement is related to the stimulus quantity

Attachment 2: List of instruments used for testing

Clause	Measurement / testing	Testing / measuring equipment / material used	Range used	Calibration due date
—	Environmental conditions	Thermo hygrometer data logger Testo, mod. 175-H2, s/n 20012247/305, inventory (1.229)	18-33 °C 30-70 %	12/2022
		Barometer Testo, mod. 176P1+0572 6174, s/n 41002029+20638516, inventory 1.893+1.894	860÷1060 hPa	08/2023
8.3	Resistance to corrosion	Dry corrosion test cabinet Angelantoni, mod. CNS500, s/n 4055, inventory 4.15	+35 °C to +40 °C	12/2021
10.2	Gaskets	Caliper Mitutoyo, mod. CD-15CPX, s/n 12602057, inventory 1.711	0-150 mm	12/2021
		Tape Stanley, mod. 8 m, s/n 30-457, inventory 1.697	1.3 m	11/2023
D.2	Tensile strength	Oven Carbolite, mod. AX60, s/n 20-602803, inventory 1.464	70 °C	02/2022
		Load cell Llyod Instruments, mod. 2500 N, s/n 12559, inventory 3.245	0-2500 N	05/2024
D.3	Compression test	Oven Carbolite, mod. AX60, s/n 20-602803, inventory 1.464	70 °C	02/2022
		Climatic chamber MSL, mod. EC500DA, s/n 15022, inventory 1.751	-20 °C	01/2022
		Micrometer Mitutoyo, mod. 130-137, s/n 1253866, inventory 1.116	0-5 mm	12/2021

- End of Report -